Henry Skinner

JUNE, 1923

ENTOMOLOGICAL NEWS

Vol. XXXIV No. 6

WILLIAM HARRIS ASHMEAD
1855-1908

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ENTOMOLOGICAL NEWS.
ACAD. NAT. SCI.
PHILADELPHIA, PENN'A.

PHILADELPHIA, PA.
THE ACADEMY OF NATURAL SCIENCES.
Logan Square

Entered at the Philadelphia, Pa., Post Office as Second Class Matter.
Acceptance for mailing at the special rate of postage prescribed for in Section 1103
Act of October 3, 1917, authorized January 15, 1921.

ENTOMOLOGICAL NEWS

published monthly, excepting August and September, in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.50 IN ADVANCE
FOREIGN SUBSCRIPTIONS, $2.70 IN ADVANCE
SINGLE COPIES 30 CENTS

ADVERTISING RATES: Full width of page. Payments in advance.

One issue, 1 in.,	$ 1.20,	2 in.,	$ 2.40,	half page,	$ 4.00,	full page,,	$ 8.00
Five issues,	" 5.50,	"	11.00,	"	17.50,	"	35.00
Ten issues	" 11.00,	"	20.00,	"	35.00,	"	70.00

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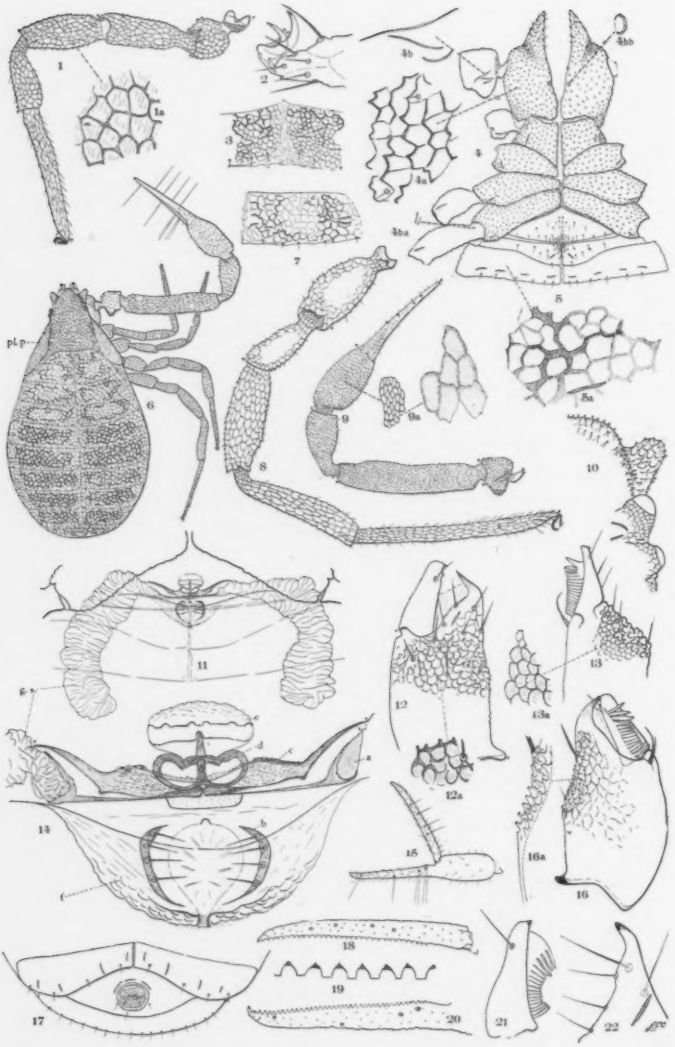

PSEUDOGARYPUS BICORNIS.—CHAMBERLIN.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

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The Genus Pseudogarypus Ellingsen (Pseudoscorpionida-Feaellidae).

By JOSEPH CONRAD CHAMBERLIN, Stanford University, California.

(Continued from page 149)

(Plate V.)

PSEUDOGARYPINAE subfamily nov.

Diagnosis—Without a ginglymous articulation between the cephalothorax and abdomen; with a distinct and prominent cephalothoracic pleural shield laterad of the carapace and dorsad of the coxae of the legs; without the double row of abdominal pleural plates so characteristic of Feaella; each anterior lateral corner of the carapace prolonged into a prominent tuberculate process; palpi typical in shape, much as in Garypus.

Pseudogarypus Ellingsen.

1909—*Pseudogarypus* Ellingsen, Estratto dal Boll. del Labor. di Zoologia generale e agra. Portici: 217-218.

Orthotype—Garypus bicornis Banks. Western United States of America.

The genus is sufficiently characterized by the sub-family diagnosis, and, since it is monotypic, by the following specific description.

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Pseudogarypus bicornis (Banks) (Plate V, Figs. 1-22).

1895—*Garypus bicornis* Banks, Journ. New York Ent. Soc. III: 8-9.

1906—*Garypus bicornis* Banks, With, Dan. Expe . to Siam 1899-1900, III. Chelonethi, Dansk. Vidensk. Selskr., pp. 100 and 103.

1906—*Pscudogarypus bicornis* (Banks) Ellingsen, T. c. 218.

Previous records and habitat notes—Banks makes the following interesting statement: "This interesting species was found by Mr. Hubbard between the laminae of rocks at Specimen Ridge, Yellowstone National Park. Many were young and had formed little cases of silk and earth, in which to pass the moulting period. The structure of these young forms is not however different from that of the adult." Ellingsen had one specimen (sex not noted) from Shasta Springs, California.

Material examined—A single adult male from Bear Lake, Utah. Collected by Dr. R. V. Chamberlin. Habitat not designated.

The three known records would seem to indicate that the species will be found to range throughout the mountain regions of Western North America from elevations of 2,000 to 8,000 feet, depending upon various climatic factors.

Measurements—All the following series of measurements are given in millimeters. Length always precedes breadth and measurements of the legs and palpi are from trochanter to tarsus. Measurements are taken in the way With describes in his paper of 1906, pp. 57-58, (ref. cited under Feaellidae).

Length 2.7 mm. Carapace, (0.72-0.396). Abdomen, (2.03-1.57).

Palpus—(0.216-0.224), (1.116-0.216), (0.522-0.225), hand (0.522-0.288), fingers (0.828).

Chelicera—Length (tip of movable finger to base of hand), 0.243; width of hand 0.234; length of movable finger 0.108.

Leg I—(0.270-0.162), (0.387-0.117), (0.342-0.126), (0.288-0.09), (0.54-0.0684).

Leg IV—(0.34-0.162, (0.306-0.108), (0.45-0.108), (0.576-0.09), (0.756-0.0684).

Palpal teeth of movable finger—Average basal width 0.0115; average heighth 0.0115; average distance between teeth, 0.0076.

In the figures the points from which measurements were made are indicated by small cross marks (Fig. 9 for example).

Morphology—The carapace is much as shown in Fig. 6, but is scarcely as sharply marked off from the pleural plates (Fig. 6 pl. p) as might be inferred from the drawing. Rather the demarcation is a sort of "fading" from the hard reticulated chitin to a similarly reticulate divisional membrane and thence to chitin again, much as shown in Fig.

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3. There is a slight trace of a median longitudinal furrow but this is not surely valid. The two anterior lateral horns arise from under the eye tubercles and extend forward almost even with the anterior median part of the carapace. Both anterior and posterior eyes are borne upon distinct tubercle-like processes (Fig. 10). Closely associated with the eyes (Fig. 10) are two or three lyriform fissures. The pleural plates are more or less sub-triangular, the apex lying almost directly under the posterior eye, while the more or less evenly rounded basal portion lies about even with the anterior margin of the third pair of coxae. Apparently they are somewhat more heavily chitinous than the carapace.

There are only ten visible tergites, the eleventh being fused with the last sternite and being completely invisible from a dorsal aspect. All tergites with the exception of the tenth are divided longitudinally by a distinct membranous suture, or rather area (Fig. 4). The first two tergites lie between the pleural plates and in consequence are considerably smaller than those which follow. Each tergite bears posteriorly from 18-20 or more minute setae which are very difficult to see on account of the heavy reticulation of the tergite and their minuteness. Likewise bordering the posterior margin of each tergite are about 10-18 lyriform fissures which are anterior to the setae row and which lie more or less laterally. Segment V bears 16 such fissures and in addition has one near each anterior lateral corner; the bordering setae number 20.

The chelicerae are basally (all but the fingers) entirely hidden from the dorsal aspect by the carapace. They are so completely figured (Figs. 12, 13, 16, 21, and 22) that there is little point in describing them in detail but a few points should be noted. The serrula exterior consisting of 17 or 18 teeth, is fused along its entire length to the movable finger, but as is clearly shown in Fig. 21 it is not a very long step to a condition where it would be distally free. This is practically identical with the type found in a few, if not many, of the Obisiidae, forms which are supposed to have this organ distally free. Lamina exterior absent or possibly present in a much reduced vestigial condition. The serrula exterior is apparently of a broad plate-like type and not toothed as in many forms, but its structure could not be worked out in any but the most sketchy way with the material available. The galea is apparently present (Fig. 13) but it is broken off on both chelicerae of my specimen. The arrangement of the setae and lyriform fissures will almost surely be found to be generic in character. The flagellum consists of two apparently simple setae, the anterior one of which is longest and also strongly curved distally (Fig. 13-16). An interesting feature of the chelicerae is the extremely rugose and heavily chitinized area on the basal part of the fixed finger and that part of the hand adjacent to it (Fig. 16 and 16a). Fig. 16a shows by a dotted line the actual thickness of the chitin and shows how greatly it increases in density where the rugosity is greatest. These rugose portions of each chelicera normally face each other and hence it seems likely that they

are manducatory in function, their rugosity and heavy structure admirably adapting them for a crushing or tearing function.

The coxae of the palpi or the maxillae are very large, having almost as great an area as that of the coxae of all the legs combined. They partially overlie the basal part of the chelicerae. I am not able to entirely follow With, in his excellent treatment of the maxillae in his paper of 1906, but apparently he applies this name to the entire coxae of the palpi. The anterior seta bearing portion is spoken of as the manducatory portion (Fig. 4). The central elliptical lyriform fissure is present but rather small (Fig. 4bb). This fissure is found in many of the Obisiidae and some of the Garypidae, but not apparently in the Cheliferidae or related families, thus forming another bit of evidence tending to show that the affinities of the genus *Pseudogarypus* are not with the single-segmented-tarsal forms. The labrum apparently consists of a rather elongate, narrow process, which is semi-membranous in structure, with an evenly rounded anterior termination. The sucking organ and a number of other oral structures could not be worked out in my specimen. The trochanter of the palpus bears ventrally a system of three prominent lyriform fissures (Fig. 4b), while the trochanter of each of the legs bears a single one. Minute setae are sparsely scattered over the coxae. Each coxa bears a single lyriform fissure near its posterior lateral corner.

The palpi while resembling those of *Garypus* are notable for their comparatively short tibia, which is no longer than the hand. (Fig. 9). The arrangement of the tactile setae is figured in detail. All the setae have been broken off in my specimen but the wide areoles leave no doubt as to their function. The prominence and even and compartively wide spacing of the palpal teeth is noteworthy. The fixed finger bears 41 teeth; the movable one 33.

The legs are figured in detail, showing the approximate distribution of the setae and the characteristic reticulation. The setae bordering the posterior margin of the tarsi are apparently not paired although giving a superficial appearance of it. No tactile setae were observed on any of the legs, nor were any areoles noted which were fitted for their reception. This latter might be very easily overlooked however owing to the roughness of the reticulations. Both claws and subterminal setae are simple (Fig. 2). The smooth place on the trochanter and pars basalis of Leg IV (Fig. 8) is apparently where they rub against the body of the animal.

The genitalia are fairly complex and present a very characteristic general appearance (Fig. 11 and 14). Owing to the lack of a terminology it is impossible to say much concerning the genital characters other than to point out some of the most salient features. Overlying the entire genitalic structures are the first two abdominal sternites (really the first and third?), the first one entire and more or less subtriangular, the second one typically divided. They bear medially

a dense cluster of minute setae (Fig. 5). Everything shown in Fig. 14 is internal. The genital sacs (Fig. 11 g. s.) form one of the most interesting features. They are almost surely homologous with those similar structures found in the males of *Garypinus* (Chamberlin, 1923).* These genital sacs are found generally throughout the Obisiidae apparently. The prominent lateral chitinous rods or apodemes (Fig. 14-c) apparently help support these sacs. They are connected across ventrad of the median chitinous loop (Fig. 14-d) by a rather slender chitinous rod or bridge. Apparently they attach basally to the median loop. Projecting anteriorly from this loop extends a short chitinous rod which bears distally a complex semi-membranous sac (?) or structure (Fig. 14-e). The genital sacs themselves seem to arise from two slender rods which distally flare into a cone-like funnel structure (Fig. 14-a). Posteriorly there appear two prominent crescent-shaped sclerites, each bearing four prominent setae (Fig. 14-b). Apparently ventrad (not surely) of these sclerites is a large, lunate, rather weakly chitinized structure which I believe to be the wholly invaginated and hidden second ventral sternite (Fig. 14-f).

As I see it the ventral segmentation is as follows. There are in all 11 sternites (the normal number of segments in the Pseudoscorpionida). Of these the last one has fused with the 11th tergite to form the shield bearing the anal opening (Fig. 17). The first one is the broadly triangular, unpaired sclerite which lies immediately behind the fourth coxae. The second one then consists of the aforementioned lunate, internal, unpaired structure (Fig. 14-f) which has been entirely invaginated and hidden by the forward growth of the third sternite which thus superficially appears as the second segment (Fig. 5). Thus the second segment has been modified for some special function in connection with the genitalia. (A study of female and immature specimens, I should say, will prove or disprove this theory). In structure and general appearance the sternites are very similar to the tergites. The central reticulation of each lateral half is however visibly different, the reticulations forming a sub-circular region where the areas enclosed by the somewhat fainter than normal reticulations, are considerably smaller than on the rest of the sclerite. The fifth sternite is bordered posteriorly by a row of 24 minute setae and 10 lyriform fissures. The lyriform fissures of the posterior segments appear to have a distinct tendency to assume a longitudinal position in the sternites but this is not the case in the anterior ones (Figs. 5 and 17). An interesting feature is found in the lyriform fissures which tend to encircle the anal opening. Each half of the bi-partite anal operculum bears two minute setae (Fig. 17).

Remarks—Unfortunately I am unable to say anything regarding the structure of the spiracles. Apparently they are

*1923—Chamberlin, J. C., Proc. Calif. Acad. Sci., Vol. XII.

located in the more or less membranous portion of the abdominal pleura and hence are practically impossible to observe without more dissection than is advisable in the present case.

The skin structure forms one of the most characteristic features of the animal. It seems to be very much like that found in *Feaella*, but as I have seen no specimens of the latter genus I cannot speak definitely. The figures give a fairly adequate impression of its general appearance.

EXPLANATION OF PLATE V.

1—Leg I.
1a—Detail of skin reticulation of leg.
2—Detail of tip of tarsus of Leg I.
3—Median portion of 7th abdominal tergite, showing membranous median area and longitudinal scutal suture.
4—Coxae of legs and palpi.
4a—Detail of skin reticulation of coxae.
4b—Lyriform fissures of coxa of palpus.
4ba—Small lyriform fissures on dorsal aspect of pedicel of trochanter of Leg IV.
4bb—Circular lyriform fissure of coxae of palpi.
5—Genital area and first few ventral abdominal segments showing distribution of superficial setae and lyriform fissures.
5a—Skin detail of abdominal sternites.
6—General dorsal aspect of entire animal showing general appearance. The tactile setae of the fingers of the palpi were broken off in the specimen available for study.
7—Skin detail of right half of 2nd abdominal tergite.
8—Leg IV.
9—Palpus (On smaller scale than 1 and 8).
9a—Skin detail on hand of palpus.
10—Detail of carapace. Right half of anterior margin showing the anterior "horns" and the positions of the eyes.
11—General aspect of internal genital structures, showing primarily the position and relative size of the convoluted *genital sacs*.
12—Dorso-lateral aspect of chelicerae.
12a—Skin detail on chelicera.
13—Lateral aspect of chelicera.
13a—Skin detail.
14—Details of internal chitinous structures of the genitalia.
15—Claw of palpus from a lateral aspect. Tactile setae not seen.
16—Ventro-lateral aspect of chelicera.
16a—Detail of heavily granulate margin of chelicera. The dotted line indicates thickness of chitin.
17—Ventral aspect of tip of abdomen showing the fused 11th tergite and sternite which medianally bears the anus with its divided operculum.
18—Lateral aspect of movable finger of claw of palpus showing dentition and positions of the tactile setae areoles.
19—Detail of dentition of fingers of claw of palpus.
20—Lateral aspect of fixed finger of claw of palpus showing dentition and positions of tactile setae areoles.
21—Dorsal aspect of movable finger of chelicera.
22—Ventral aspect of fixed fingers of chelicera.

Notes on the Desmodium Sawfly, Atomacera desmodii Dyar* (Hymen.: Tenthredinidae).

This species, while not recorded by Smith in his "Insects of New Jersey," is known to occur at Monmouth Junction and undoubtedly exists in other sections of the state where its food plant grows. It was described by Dyar in 1900 (Jour. N. Y. Ent. Soc., vol. VIII, pp. 26-27) from specimens collected by him in company with Mr. Busck in Alexandria County, Virginia.

At Monmouth Junction, New Jersey, adults appear from about the middle of May to the first week of June and the females deposit their eggs in the leaves of *Meibomia* (*Desmodium*) *canadensis,* which plant is common along the borders of streams and swamps in the northern half of the state. The egg is inserted in the leaf from the upper surface and the tissue is pushed out considerably above and to a small extent below each egg. This results in a little, blister-like swelling which later becomes tinged with red. The presence of eggs is readily recognized by such discolored swellings. Each egg is whitish, translucent, irregularly bean-shaped, broadly rounded at both ends, somewhat compressed at sides and about 0.7 mm. long and 0.48 mm. wide across the middle. Some eggs are deposited in irregular, somewhat compact groups, whereas others are placed scatteringly in the leaf tissue. Various leaves were examined and found to contain from 5 to 30 eggs each.

After hatching the larvae feed on the lower surface of the leaf eating everything except the upper epidermis. The leaf is thus skeletonized from the lower surface. The larvae are somewhat gregarious and feed in groups of two or three or more. Most of them are greenish, but some of them have a pink or red tinge, many of these latter ones, however, being mature or nearly so. In severe infestations nearly every leaf on a plant is injured and sometimes killed.

After becoming full grown the larvae descend to the base of the plant and construct on the surface of the ground, somewhat loose, irregular, sepia-colored cocoons. In captivity, with soil absent, these cocoons are made between two parts of a folded leaf or between the small developing leaves at the tip of a shoot. Pupation requires about eight days during the summer and the winter is passed by either larvae or pupae in cocoons at the base of plant. Observations made in the field at Monmouth Junction indicate two broods, about two months being required for a complete life cycle. Adults are present in numbers during the last of May and first part of June and again during the last of July and first part of August. Due to the emergence of the adults and egg deposition over a period of several weeks, considerable overlapping of the broods takes place. The larval stages were described by Dyar (loc. cit.) and need not be gone into here.—HARRY B. WEISS and RALPH B. LOTT, New Brunswick, N. J.

* Identified by Mr. S. A. Rohwer through the courtesy of Dr. L. O. Howard.

Studies on Costa Rican Odonata.

X. Megaloprepus, Its Distribution, Variation, Habits and Food.

By Philip P. Calvert, University of Pennsylvania, Philadelphia, Pa.

(Continued from page 135.)

HABITAT.

As has been stated in the Neuroptera volume (page 53) of the *Biologia Centrali-Americana*, *Megaloprepus* is an inhabitant of tropical forests. The "Florida road," west of Guápiles, from which our specimens Nos. 2-7 were obtained was, to quote from my diary of June 3, 1909:

a trail leading into untouched forest . . . westward. . . . We followed it for about a mile perhaps. . . . Its width varies and is often not greater than that of one's body, but is travelled often on horse- or mule-back. On each side of the trail the vegetation is so thick and dense that one can not make way for more than a few feet unless he cut it with a machete. . . . In this forest are mingled deciduous exogenous trees of many kinds and a variety of palms. The former are rather high on the whole perhaps, but there are many exceptions. All the trees lack branches until they are many feet above the ground but this lower space is occupied by the epiphytes and parasitic plants, bromeliads, ferns, orchids, lianas and other vines which from the trunks or from the far-away branches shoot upward or hang down and twist and twine in both profusion and confusion. On the ground itself are shrubs and smaller plants reaching up to mingle with those descending. There is much difference in the trunks of the trees as to bareness or to being covered with lichens. The large exogenous trees rise out of the soil with many ridge-like buttresses, while the palms have many aerial roots. Most of the birds are far away overhead in the foliage of the trees proper, but sometimes an opening above, admitting sunshine, gives a glimpse of them, or there is a swarm of butterflies around a full-flowered tree. [Peccaries and red monkeys were observed by some of our party here this day.]

Another forest area near Guápiles, in which male No. 1 was taken on June 2, 1909, and which was revisited on June 4, is described in my diary of the latter date in these words:

The forest differs from that through which the Florida road passes in the very much fewer palms to be found in it, although the difference in elevation is not more than 100-200 feet. It may have been partially cleared once, but as many of the tall exogenous trees are untouched

and surrounded by thick growth it seems unlikely that these would have been left and the palms cut out if they had been here, since comparatively few species of the latter are of use to man.

The female from Guacimo, of June 7, 1909, was brought to me alive by Messrs Stähle and Blair, who said that they had caught it in the banana field. As these fields in many places extended to the forest, no long flight would be required of the *Megaloprepus* to come into the open.

The cañon of the Rio Reventazón at Juan Viñas, in which this species was observed on June 25 and September 29, was occupied by the remains of a forest including

great trees draped with mosses and Tillandsias, hung with lianas, with epiphytic bromeliads and arums perched on every projection. On a lower level were small palms, begonias, maiden hair and other ferns, arums large and small, and many kinds of Musaceae and Marantaceae, etc., many with large bracts of brilliant red or orange. A cart road descended the side of the cañon in a series of zigzags.

At Peralta, on August 7, 1909, a *Megaloprepus* was watched in

tropical forest with very tall exogenous trees and many palms from both of which hung lianas, mosses and ferns, the lianas binding the trunks and branches together, while the soil was very damp and in places deep mud. Altho' the sun was shining the foliage was dense enough to prevent strong light from reaching the ground. . . . It was between two views of monkeys [*Cebus capucinus*] that I saw a *Megaloprepus* . . .alight first on one then on another twig, 7-10 feet above a little stream whose waters were arched over and partly covered by vegetation. . . . [The next morning, August 8], I went back to the woods where I saw the monkeys and *Megaloprepus* yesterday afternoon, but although I spent two hours in the immediate neighborhood, I saw none of the two M's.

On August 10, I went up the Chiriquí [?] river trail; the river empties into the Reventazón one mile north of Peralta station on the railroad. After passing through woods,

I reached a clearing with much grass and a few trees, beyond which was a grove of large trees with no undergrowth or grass, the ground much cut up with hoofs and muddy. Crossing this clearing I caught a *Megaloprepus* much to my surprise—the locality was indeed 'far from water' but certainly not 'deep woods.' The buttress-roots of some of

the trees in the grove enlarged the diameters of their trunks at the ground to twenty or thirty feet. The altitude of the little hill on which this grove was situated was 1400 feet by my aneroid.

One individual *Megaloprepus* was observed in a stretch of woodland along Agua Buena creek, within two miles of the Caribbean coast, on November 7, 1909,

alighting on leaves and stems for longer or shorter periods, sometimes directly over water, at others not more than ten feet away, and sometimes not more than one foot from the water's surface.

Another individual was seen, at about five miles (8 km.) distant from the preceding locality and six miles from the sea-coast, in dark forest, near the upper reservoir, on the Rio Banana, supplying Limón with water, November 9. In this same forest were seen or taken *Mecistogaster modestus, Philogenia carrillica,* [*] *Protoneura remissa, Gynacantha gracilis* and *Triacanthagyna satyrus* Martin, teste Wllmsn. (*trifida* auctorum, *pars*).

Time of Flight.

The dates when the imagos were seen or taken on the Atlantic slope of Costa Rica fall between April 22 and November 18. These are in the wetter part of the year although no sharp distinction into wet and dry seasons can be made for this slope. The few dates from the Pacific side of the country, where this distinction holds good, are in the wet season; one exception, however, must be noted. The male from Quebrada de Java, cited in the *Biologia*, page 352, was dated 18. II. 97, presumably, therefore, in the dry season.

Manner of Flight and Position at Rest.

The following notes were made at Guápiles, June 2, 1909:

When flying the four wings are spread quite far apart, fore and hind wing of the same side far apart, body horizontal. Flight slow enough so that the movements of each separate wing can be seen—insect consequently moves slowly but can dodge. Mr. Barnes compared the movements of the wings to that of a windmill, but the revolving movements are lacking; I should say the effect produced by the wings is more like that of a jumping-jack with movable arms and legs pulled by one string, rather slowly, but, of course, at regular intervals.

When caught and held by the wings, the legs are folded up against

the thorax and held immovable, even though they are touched or rubbed —animal seems to "play 'possum." Held by the mid-abdomen, movement soon appears in legs and wings.

The male on which these notes were based was kept alive and after dark let loose in my bedroom, whose walls and ceiling were of dark-stained wood, with yellow straw matting on the floor, and having an incandescent electric light hanging from the ceiling in the centre of the room. [The light was turned on.] *Megaloprepus* always went up to the ceiling, a height of 8-9 feet, although the light hung at mid-height from floor to ceiling. Once, when released near the light, the insect got under its fluted shade and bumped against it repeatedly until I gently moved the insect out and then the latter went up to the ceiling. I noticed that specimens in the forest at which I struck and missed usually rose, at the same time making into the vegetation.

The dark purple blue band on the otherwise clear wings makes the insect conspicuous when flying through the forest. Some writers, who have not seen this insect in life, have suggested that the dark bands, by resembling flickering shadows cast by leaves, etc., are thereby protective, but I can not see that this supposed resemblance exists.

As to the position assumed by *Megaloprepus* when at rest under entirely natural conditions, I have but one note, made at Peralta, August 7, 1909, in continuation of that quoted *anteá*, page 169, viz.: that on alighting on twigs, the abdomen and wings hung downward, the abdomen almost perpendicularly.

The experiment in my bedroom, the occurrence of the specimens in the banana field at Guácimo and in the grove on the Chiriqui river trail near Peralta may, perhaps, indicate positive geotropic and phototropic tendencies in this insect in spite of its normal habitat in dense forest.

Persistence of Life Without Food.

The female taken at Guácimo on June 7, 1909, was carried alive to Cartago where it flew a little around our room in the afternoon of June 8 and had some power of wing movement on June 9.

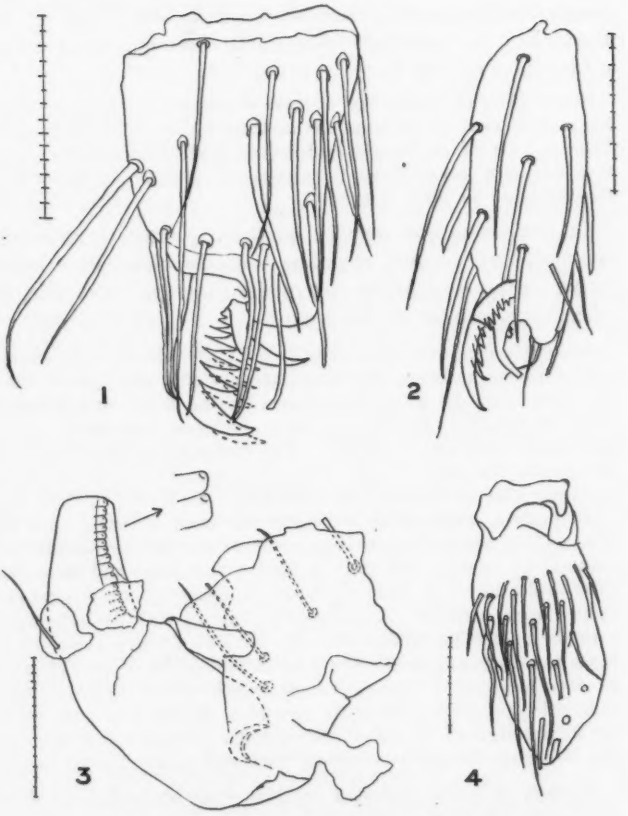
Food.

The male *Megaloprepus* No. 14, taken at Alajuela, Costa Rica, August 8, 1915, by Mr. D. E. Harrower, remained in the paper envelope in which it had been placed by the collector until August 10, 1922. It was then studied in detail for the

first time and was found to have a spider, about 5 mm. long, in its mouth. The spider was held principally by the dragonfly's labium which was below the prey, all the other mouth parts being above it and their positions not indicative of having had hold of it at the time of death of the dragonfly. The maxillae were almost touching each other at the tips of their inner lobes, the mandibles had their tips partly crossed. The median lobe of the labium was thrown caudad of the lateral lobes, the position of the latter being such that their sharp (unarticulated) spines held the spider between them. The anterior four legs of the dragonfly were drawn up toward the mouth and in the dead insect supported the anterior part of the spider's body—whether this was only a death position or represented actual conditions while the dragonfly was alive, it is impossible to say. It was the hind end of the spider that was held by the lateral labial lobes; it had already been lacerated and some small detached pieces of it were found deeper in the dragonfly's mouth. The chelicerae, pedipalps and all eight legs of the spider were still attached to its body, but several of the more distal joints of the anterior three left legs had become detached when the examination was made, which was after the dragonfly in its envelope had been in a relaxing jar for 24 hours.

This spider was kindly examined by Mr. Nathan Banks who wrote that it was "an immature specimen of a *Gasteracantha;* it might be one of two or three closely related species, probably *cancriformis* or *kochi.*"

It is frequently my practice, when collecting Odonata, to put each specimen at once, into a paper envelope for some hours before killing it in order that it may empty the contents of its alimentary canal and so lessen the amount of decomposition within its body after death and reduce the extent of discoloration of the abdomen. Having done so with some of my *Megaloprepus* and having preserved their excrement, I softened the pellets in distilled water, teased them apart, dehydrated, cleared and mounted them in balsam. A microscopic examination of the excrement of male No. 1 revealed the two fragments represented in text figures 1 and 4, while from that of



FRAGMENTS OF SPIDERS FROM THE EXCREMENT OF *Megaloprepus caerulatus*.

Fig. 1, Apex of tarsus with claws, s me of the lower claw dotted. Fig. 2, A last tarsal joint; one of the serrate claws is broken straight across at less than half length, the other is intact. Fig. 3, Basal part of a chelicera; dotted lines show hairs on the under side of the preparation. Fig. 4, Terminal joint of a pedipalp?[13] Figs. 1 and 4 are from the excrement of male No. 1, figs. 2 and 3 from that of female No. 8. All four drawings were made by camera lucida attached to a compound microscope with oculars 2 or 3, objectives C or DD Zeiss. Alongside each figure is a scale in 1-100s of 1mm.

[13] A comparison of our figures 1-4 with the following figures in Prof. J. H. Comstock's *Spider Book:* 121, 122, page 123 (tarsal claws); 81, page 101 (chelicera); and 90, page 105 (pedipalp), respectively, will enable the interested reader to judge of the probability of the correctness of the legend below our figures.

female No. 8 came the pieces shown in figures 2 and 3. Mr. Banks saw the drawings from which these figures have been made and wrote of them:

> Numbers 1 and 2 show tips of tarsi of probably an Agalenid spider, but if front tarsi might be, as far as I can tell, of a Theridiid spider. They are not of an Epeirid spider (family of *Gasteracantha*), since there are no accessory claws (serrate spines) present. I cannot guess the family of the other figures.

In this connection may be quoted a passage from a non-entomological source[14] recording the only observation known to me on the food habits, not of *Megaloprepus* it is true, but of another member of its group:

> Spinning through the aisles made by the giant columns of tree-trunks, were curious translucent pin-wheels, and not until we captured one in the butterfly net did we realize we were looking at the same attenuated forest dragon-flies (*Mecistogaster sp.*) which had deceived us so completely five years ago in Mexico. The movement of the long narrow wings with the spot of white at the tips was, to the eye, a circular revolving whirl, with the needle-sized body trailing behind. The white spots revolved rapidly, while the rest of the wings became a mere gray haze. These weird creatures, apparently so ethereal and fragile, were hunting for spiders, and their method was regular and methodical. From under leaves or from the heart of widespread webs, good-sized spiders were snatched. A momentary juggling with the strong legs, a single nip and the spider minus its abdomen dropped to the mould, while the dragon-fly alighted and sucked the juices of its victim. If we drew near one of these spiders on its web, it instantly darted away, sliding down a silken cable to the ground or dashing into some crevice, but the approach of the hovering dragon-fly, although rather deliberate, was unheeded, the spider remaining quiet until snatched from its place.

Spiders are not included in Mr. Campion's list of *Some Dragonflies and their Prey*.[15]

I was unable to find the still unknown larvae of *Megaloprepus*. One would expect them to occur in situations analogous to those of *Mecistogaster*, whose larval characteristics and transformation were described in Numbers II and III of these Studies.[16]

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[14] Beebe, M. B. and C. W. Our Search for a Wilderness, New York, Henry Holt & Co., 1910, pp. 270-271. The observation was made near the Big Aremu River, British Guiana, in late March, 1909.

[15] Annals & Magazine Nat. Hist., London, (8) XIII, pp. 495-505. 1914

[16] Entom. News, XXII, pp. 402-411, 449-460, pls. xvii-xix, 1911.

The Cordylurid Genus Paralleloma and its Nearest Allies (Dipt.).

By J. R. Malloch, U. S. Bureau of Biological Survey, Washington, D. C.

(Continued from page 140.)

PARALLELOMA Becker.

This genus is difficult to distinguish from *Cordylura*, at least in this country, if one attempts to do so by using the principal character cited by its describer for that purpose. The dorsocentrals in the great majority of the species of *Cordylura* are very much stronger than in typical species of *Paralleloma*, but in some species they are weak and only the complete sixth wing-vein serves to separate them from *Paralleloma* when this is the case. I have included in the key *Cordylura praeusta* Loew, and a new species of that genus which have the thoracic dorsocentrals much weaker than is the rule in *Cordylura*, though they belong to that genus.

The genotype of *Paralleloma, albipes* Fallen, has the apical third of the first wing-vein setulose as has also another European species I have seen. No American species has more than one or two weak setulae near apex of first vein but I do not consider they are entitled to generic separation.

Thoracic coloration in this genus is very variable, some species having the dorsum entirely black, or yellow, or with a pale central vitta and two black lateral vittae.

Keys to species.

Males.

1. Mid tibia without long hairs on ventral surfaces 2
—Mid tibia with erect soft hairs on ventral surface which are at least as long as diameter of tibia 3
2. Basal segment of fore tarsus with fine hairs on posterior side which are longer than width of segment, mid and hind femora with dense erect soft hairs ventrally; processes of fifth sternite rounded at apices .....*tarsalis* sp. n.
—Basal segment of fore tarsus and mid and hind femora without such hairs; processes of fifth sternite truncate at apices..*scapularis* (Loew)
3. Sixth wing-vein complete; fifth abdominal sternite elongate, tapered posteriorly, bare on disc, and armed with a number of black bristly hairs along its upper margin; thorax entirely yellow ....*Cordylura praeusta* Loew.

—Sixth wing-vein not reaching margin of wing; fifth abdominal sternite not as above 4

4. Processes of fifth abdominal sternite rounded at apices, their surfaces with long and moderately dense hairs all over 5

—Processes of fifth abdominal sternite either emarginate at apex or the surface has at most a few weak hairs 6

5. Fore tibia with long yellow hairs on posterior surface in addition to the yellow bristles; pleurae largely black or at least with a black streak posteriorly; mesonotum black to extreme lateral margin .....*pleuritica* (Loew) (*slossonae* Coquillet; *vicina* Cresson?)

—Fore tibia with very short yellow hairs, the strong bristles black and not very long; pleurae entirely yellow; mesonotum narrowly yellow along lateral margins .....*dimidiata* Cresson

6. Neither mid nor hind femora with strong black bristles ventrally....7

—Both mid and hind femora with strong black bristles ventrally.....8

7. Fore tibia with soft hairs on posterior surface which exceed in length the diameter of tibia; all hairs on mid tibia much longer than diameter of tibia; fifth abdominal sternite broad, longer than in *pracusta*, the apex with a slight rounded emargination...*emarginata* sp. n.

—Fore tibia similar to above; mid tibia with hairs not distinctly longer than its diameter except on its posterior side; processes of fifth abdominal sternite slightly pointed at apex, the ventral margin longer than the upper and straight, the upper or dorsal margin with a small but distinct rounded emargination near base, the apex not emarginate .....*banksi* sp. n.

8. Fore tibia with short hairs in addition to the long bristles; mid tibia with the ventral hairs not longer than the tibial diameter except posteriorly; posterior notopleural bristle present; sixth vein tapered to a fine line apically; processes of fifth abdominal sternite short and broad, with a small rounded emargination.....*similata* sp. n.

—Fore tibia with short hairs, the bristles weak; all hairs on ventral surface of mid tibiae as long as, or longer than, tibial diameter; posterior notopleural bristle absent; sixth vein abruptly broken off at apex; processes of fifth abdominal sternite narrow and rounded apically, their lower margin straight to near middle, presenting a truncate appearance and with a few short setulose hairs at lower anterior angle .....*munda* (Loew)

Females.

1. Fore femur with 3 long, black bristles on basal half of posteroventral surface; cross-veins of wings not distinctly infuscated; mid and hind femora without ventral bristles .....*scapularis* (Loew)

—Fore femur with at least 4 long, black bristles on posteroventral surface, the last one distinctly beyond middle, at least the outer cross-vein infuscated; hind femur with ventral bristles.....2

2. Sixth wing-vein complete, traceable to wing margin 3

—Sixth wing-vein not reaching margin of wing 4

3. Yellow species, legs and palpi yellow; a pair of fine setulose apical hairs on scutellum; abdominal tergites with distinct apical bristles .....*praecusta* Loew

—Glossy black species, legs black, bases of femora and entire fore tibia yellow, fore tarsi yellow at bases of segments below, and black at apices; no apical hairs on scutellum; abdominal tergites without distinct apical bristles .....*deceptiva* sp. n.

4. Mid femur with one or two strong bristles beyond middle on anteroventral surface; thorax either entirely yellow or with two linear brown dorsal vittae, both notopleural bristles long and strong; first vein with one or two setulae on apical half.....*similata* sp. n.

—Mid femur without anteroventral bristle, or the thoracic dorsum is largely or entirely black; first vein bare 5

5. Mid femur with one or two bristles on apical half of ventral surface; posterior notopleural bristle present; pleurae yellow; ventral bristle on mid tibia of moderate size .....*glabra* (Loew)?

—Mid femur without bristles on apical half of ventral surface 6

6. Pleura with a black vitta below base of wing; last section of costa, between apices of veins 3 and 4, less than half as long as preceding section; humeri almost entirely black; ventral bristle on mid tibia strong .....*pleuritica* (Loew)

—Pleura entirely yellow; lower half of humeri yellow 7

7. Posterior notopleural bristle absent; mid tibia with a ventral bristle .....*munda* Loew

—Posterior notopleural bristle present 8

8. Thoracic dorsum glossy black .....*dimidiata* Cresson

—Thoracic dorsum yellow, with 2 broad black vittae ...*emarginata* sp. n.

Paralleloma scapularis (Loew).

Pale yellow, black on upper half of occiput, ocellar spot, each side of dorsum of thorax and scutellum, almost all of metanotum, and the abdomen except hypopygium in male. Wings clear.

Mid and hind femora in both sexes without distinct ventral bristles. The only male I have seen lacks the prealar bristle.

Originally described from Canada. I have seen specimens from Glen House, New Hampshire, and Cohasset, Massachusetts, and took it at Chain Bridge, Virginia, and Grand Tower, Illinois.

Paralleloma tarsalis sp. n.

♂.—Shining black; head whitish yellow, upper half of occiput and ocellar spot black; thorax with a yellowish vitta which does not extend over scutellum; a black mark covers most of the metanotum and is faintly visible below bases of wings and above hind coxae; processes of fifth sternite and the legs yellow. Outer cross-vein and tips of wings clouded.

Hairs on fore tibia short, the bristles weak; fore tarsus slightly broadened, the marginal hairs longer than usual, especially on posterior side of basal segment; mid and hind femora with soft erect dense hairs on ventral surfaces which are not conspicuously longer at any part than diameter of femur; mid tibia without soft hairs, the bristles short. Processes of fifth sternite moderately long, parallel-sided, rounded apically with but few hairs. Venation as in *munda*.

Length, 7 mm.

Type, Chain Bridge, Virginia, May 7, 1922 (J. R. Malloch), in the author's collection. *Paratype*, male, Ottawa, Canada (U. S. N. M.).

Paralleloma pleuritica (Loew).

Pale yellow, black on occiput except lower third, upper half or more of frons, entire dorsum of thorax, scutellum and metanotum, all of abdomen except the hypopygial forceps of male, and a stripe below and behind bases of wings, and sometimes the greater part of pleurae. The hind femora are sometimes brown above apically, and there is usually a brownish suffusion on the cross-veins and apices of wings anteriorly.

The male has the fore and mid tibiae long haired ventrally and posteriorly and all the femora long haired ventrally and without distinct ventral bristles. The female has a preapical anteroventral bristle on hind femur, and a preapical ventral bristle on mid tibia. The processes of fifth abdominal sternite in male are a little longer than broad and evenly rounded apically.

Originally described from Canada. Since recorded from Massachusetts, New Hampshire, Connecticut, and New Jersey. I have seen specimens from Rhode Island and Illinois. Coquillett described this species as *Cordylura slossonae* from Massachusetts, and New Hampshire, and Cresson as *vicina* from Pennsylvania.

Paralleloma dimidiata Cresson.

In addition to the characters mentioned in the key this species differs from *pleuritica* in having the fore tarsi slightly broadened in both sexes and with fine hairs along the posterior margins, most noticeable on basal segment and in male.

Originally described from Pennsylvania. I took a male and female at Glen Echo, Maryland, July 2, 1922. The female was previously unknown.

Paralleloma similata sp. n.

Glossy testaceous yellow, with the upper part of occiput, posterior part of frons and dorsum of thorax darker; ocellar spot and two narrow, submedian, dorsal vittae on thorax blackish; abdomen varying from brown to fuscous. One male from New Hampshire has the

dorsum of the thorax almost entirely brownish black, and the abdomen except the hypopygial forceps and processes of fifth abdominal sternite similarly colored. Legs entirely yellow. Wings with the cross-veins and the tips of longitudinal veins at apex of wing slightly infuscated.

The mid and hind femora in male are rather long haired ventrally and have each one or two preapical black bristles on anteroventral surface. The female has no long hairs on the femora and the anteroventral bristles are farther from apex. Both the mid and hind femora in this sex have a very long, fine bristle at base on ventral surface and the mid and hind tibiae have each a preapical, ventral bristle. Posterior notopleural and prealar bristle both long. Processes of fifth abdominal sternite not longer than broad, with a small rounded emargination in apical margin, the surface almost bare, with a few hairs along the truncate part of lower margin.

Length, 7-8 mm.

Type, male, and *allotype,* Ottawa, Canada, May 15, in the author's collection. *Paratypes,* one male, Bretton Woods, New Hampshire, June 26, 1913; one female, Mt. Washington, New Hampshire, July 28, 1915, 2500 ft. (C. W. Johnson).

Paralleloma munda (Loew).

This species closely resembles *pleuritica* Loew and more especially the form in which the pleura are largely yellow, the color being almost identical except that the black streak on posterior part of pleura is either absent or very short in *munda.* The femora are also pale in both sexes. The processes of the fifth abdominal sternite in the males of the two species are very different, that of *munda* having a truncate part on lower margin which is about half as long as the process, and there are only a few hairs present which are confined to the anterior angle of the truncation on lower margin.

Originally described from Canada and since recorded from New Hampshire. I have taken it frequently in Illinois and it is common near Washington, D. C., in May, where it is the commonest species of the genus. I have also seen it from Quebec, Canada.

Both sexes have a color variety with a broad yellow dorsocentral thoracic vitta which extends over disc of scutellum.

Paralleloma emarginata sp. n.

In color similar to the vittate variety of *munda.*

The processes of the fifth ventral abdominal sternite of male differ very strikingly from those of *munda,* being a little longer than broad, of equal width to apex and with a broad rounded emargination at apex; the lower margin has a few hairs on apical half which extend onto the disc slightly.

Length, 7-8 mm.

Type, male, Auburndale, Massachusetts, August 2. *Allotype*, same locality, June 26. *Paratype*, Riverside, Massachusetts, May 22 (C. W. Johnson); Germantown, Pennsylvania, May 25, 1907 (Harbeck). In the collection of the Boston Society of Natural History.

Paralleloma emarginata var. **dorsalis** var. n.

Differs from the type form in having the dorsum of thorax glossy black, and the propleura and metapleura dull black. In other respects similar to type.

Length, 8 mm.

Type, Chain Bridge, Virginia, May 23 (N. Banks) in Mr. Banks' collection.

Paralleloma banksi sp. n.

♂.—Similar in color to the dark form of *pleuritica*, the dorsum of thorax and abdomen being wholly glossy black and the pleura almost entirely black. The processes of fifth abdominal sternite of male are almost entirely yellow. Legs yellow. Wings slightly browned at apices.

The mid and hind femora have fine, but not very long, ventral hairs and no distinct ventral bristles, and only the posterior hairs on mid tibiae are distinctly longer than the diameter of the tibiae. The processes of fifth abdominal sternite are longer than broad, their ventral margin almost straight and longer than the upper, the latter with a short rounded emargination near base.

Length, 7.5 mm.

Type, New York. From the Loew collection, labelled "sp. n. *munda* aff." In the Museum of Comparative Zoology, Cambridge, Massachusetts.

Cordylura deceptiva sp. n.

♀.—Glossy black. Face and bases of palpi cream colored, frontal orbits and frons and the narrow postocular orbits white pruinescent. Fore coxae, trochanters, and bases of all femora, entire fore tibiae, knees of mid and hind legs, and bases of tarsi yellow, the apices of fore tarsal segments black below. Tips of wings and the cross-veins infuscate.

Arista short, long plumose above and below. Posterior notopleural and prealar short, only the posterior pair of dorsocentrals distinct. Scutellum with 2 strong bristles. Fore femur with 4 or 5 posteroventral bristles on basal half; hind femur with 2 or 3 anteroventral bristles on apical half; mid tibia with the ventral bristle strong; hind tibia with 2 anterodorsal, 1 anteroventral, and 2 posterodorsal bristles. Outer cross-vein nearly twice its own length from inner; first vein bare.

Length, 7 mm.

Type, Henry, Michigan, August 27, 1919 (W. L. McAtee), in the United States National Museum.

Superficially closely resembles *Achaetella varipes* Walker.

Undescribed Crane-Flies from Argentina (Dipt.: Tipulidae). Part VI.

By CHARLES P. ALEXANDER, Amherst, Massachusetts.

The species described in the present installment were all collected by Dr. Charles Bruch in the Provinces of Buenos Aires and Córdoba. My deepest thanks are extended to Dr. Bruch for his co-operation in making known the interesting Tipulid fauna of Argentina. The types are preserved in the writer's collection.

Molophilus honestus sp. n.

Head yellowish; antennae of male rather short, dark brown; mesonotal praescutum brownish yellow, the median area indistinctly darkened; pleura pale with a conspicuous, brown, longitudinal stripe; halteres yellow; wings pale brownish, subhyaline; abdomen dark brown, the hypopygium and ovipositor yellowish; male hypopygium with the ventral appendage elongate, with a small acute spine on the ventromesal face near two-fifths the length, the apex of the blade slightly flattened and with close-set appressed teeth.

♂. Length 3.4-3.5 mm.; wing 4.6-4.7 mm. ♀. Length 4 mm.; wing 4.8 mm.

Rostrum testaceous; palpi dark brown. Antennae of the male rather short, if bent backward, not extending beyond the wing-root; antennae dark brown; flagellar segments elongate-oval with the long, black verticils; in the female, the flagellar segments are cylindrical or short-oval. Head pale yellowish, the vertex with conspicuous yellow bristles.

Pronotal scutellum conspicuously white. Mesonotal praescutum brownish yellow with an ill-defined, brownish, median area, the lateral margins whitish; interspaces with long, black bristles; scutum pale, the lobes brown; scutellum broad, pale yellow; postnotum brown. Pleura pale with a whitish bloom; dorsopleural membrane whitish; a broad, conspicuous, dark brown stripe extending from the cervical sclerites to the postnotum and base of the abdomen; mesosternum brown. Halteres light yellow.

Legs with the coxae and trochanters pale yellow; femora and tibiae brownish yellow; tarsi brown.

Wings pale brownish, subhyaline, the base a little more yellowish; veins pale brown; wing-apex slightly pointed. Venation: Deflection of R_4+_5 about equal to *r-m;* basal deflection of Cu_1 about two-thirds the petiole of cell M_3; vein *2nd A* long, the distal end bent strongly toward the wing-tip.

Abdomen dark brown, the hypopygium obscure yellow. Male hypopygium with the ventral appendage very long and slender, extending almost to the ends of the pleurites, at about two-fifths the length, on

the ventro-mesal face, with a small, acute spine; the long apical point is slightly flattened near the tip, this apical blade with numerous appressed serrations. Ovipositor reddish horn color, the tergal valves rather strongly upcurved; sternal valves dark brown, slender, straight.

Holotype: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* 2 ♂'s.

Molophilus bruchi sp. n.

Antennae pale brown; mesonotal praescutum obscure yellow, with three, broad, dark brown stripes; halteres with the knobs yellow; wings with conspicuous, brownish black hairs; abdomen brownish black; ventral appendage of male hypopygium shaped as broad-based simple horns.

♂. Length about 2.8-3 mm.; wing 3.7 mm.

Rostrum and palpi dark brown. Antennae pale brown, the basal segments light yellow; flagellum short, the segments cylindrical. Head grayish brown.

Mesonotal praescutum narrowly margined with whitish, the disk obscure yellowish brown with the humeral region brighter yellow, with three, broad, ill-defined dark brown stripes, the median stripe very narrowly and indistinctly split by a pale line; praescutal interspaces with conspicuous black and yellow setae; remainder of mesonotum dark brown. Pleura dark brown, gray pruinose. Halteres light brown, the knobs conspicuously light yellow.

Legs with the coxae yellowish brown; trochanters obscure yellow; remainder of the legs dark brown.

Wings pale brown with conspicuous, brownish black trichiae; veins rather pale.

Abdomen dark brownish black. Male hypopygium with the ventral appendage in the form of a conspicuous, curved, simple horn, broad basally, tapering gradually to the acute point. Pleural appendage slender, deeply branched, the dorsal arm slender, the ventral arm widened into a truncated blade. Gonapophyses flattened, near the base on the lateral margin with a conspicuous, laterally directed spine.

Holotype: ♂, Palo Blanco, La Plata, April 24, 1920 (C. Bruch). *Paratopotypes:* numerous ♂'s.

This interesting *Molophilus* is named in honor of the collector, Dr. Charles Bruch.

Gonomyia (Progonomyia) saxicola sp. n.

General coloration pale yellow, variegated with brown; male hypopygium with the intermediate appendage bifid, the outer branch appearing as a tiny spine at the base of the long inner branch.

♂. Length 4-4.2 mm.; wing 5.8-6 mm. ♀. Length 5.8 mm.; wing 6.2 mm.

Rostrum dark brown, sparsely pruinose; palpi dark brown. Antennae dark brown, the basal segment of the scape sparsely pruinose; flagellar segments elongate. Head broad, light gray, the center of the vertex suffused with light brown.

Pronotal scutum large and conspicuous, pale brownish yellow, heavily dusted with whitish pollen; scutellum dull yellow, the median area narrowly brown. Mesonotal praescutum pale brownish gray with four dark brown stripes, the intermediate stripes very closely approximated; pseudosutural foveae large and conspicuous, black; scutum brownish gray, the centers of the lobes darker; scutellum pale; postnotum dark brown, paler laterally, the pleurotergites conspicuously light gray pruinose. Pleura pale yellow, with a broad, brownish, longitudinal stripe extending from the cervical sclerites to beneath the wing-root; sternum largely dark brown. Halteres elongate, pale, the knobs brown.

Legs with the coxae obscure brownish yellow; trochanters dull yellow; femora and tibiae obscure brownish yellow, the tips of the latter narrowly and indistinctly darkened; tarsi brown.

Wings subhyaline; stigma small, short-oval, pale brown; veins pale brown. Venation: *Sc* moderately elongate, Sc_1 extending to about one-third the length of *Rs*, Sc_2 far from the tip of Sc_1, a little before mid-length of that part of *Sc* beyond the origin of *Rs*; *r* at the fork of R_2+_3, oblique in position, sometimes indistinct; R_2 straight, in alignment with and longer than R_2+_3; cell *1st* M_2 open; basal deflection of Cu_1 at or before the fork of *M*.

Abdomen uniform brown, the sternites a little paler. Male hypopygium with the intermediate appendage darkened, conspicuous, two-branched, the lateral branch very tiny, appearing as a slender spine at the base of the long inner branch; this latter is slender, slightly curved, the tip suddenly narrowed into a short blunt spine; inner pleural appendage a slender, slightly curved spine; outer pleural appendage a fleshy lobe with the setae all on the mesal face, directed strongly backward to produce an hystriciform appearance. Penis-guard slender, narrowed to the simple apex.

Holotype: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* numerous ♂'s and ♀'s.

CRYPTOLABIS Osten Sacken **PROCRYPTOLABIS** subgen. n.

Apical cells of wings entirely without macrotrichiae; cells M_3 and Cu_1 deep. Male hypopygium with four conspicuous digitiform lobes that surround a blackened, elongate, penis-guard. Ovipositor with the valves fleshy.

Type of the subgenus: Cryptolabis (*Procryptolabis*) *argentinensis* sp. n. (Neotropical Region).

Cryptolabis (Procryptolabis) argentinensis sp. n.

General coloration brownish black, dusted with gray; wings with a faint brownish tinge, the base yellowish.

♂. Length 3 mm.; wing 3.5 mm. ♀. Length 2.5-2.9 mm.; wing 4 mm.

Rostrum and palpi black. Antennae brownish black; flagellar segments oval, provided with a sparse white pubescence. Head dark gray; front and anterior part of vertex whitish; vertex between the eyes somewhat compressed into a median ridge.

Pronotum dark, the scutellum obscure yellow. Mesonotum brownish black, sparsely dusted with gray; an impressed, transverse line that extends from the pseudosutural foveae almost across the sclerite; remainder of the mesonotum black, sparsely dusted. Pleura brownish black, the dorso-pleural membrane obscure brownish yellow. Halteres light brown, the knobs pale.

Legs with the coxae dark brown; trochanters yellowish brown; femora brown, the bases obscure yellow, narrowest on the fore legs where only the bases are pale, broadest on the hind legs where only the tips are brown; tibiae yellowish brown, the tips darker; tarsi dark brown.

Wings with a faint brown tinge; wing-base yellowish; stigma very long and narrow, pale brown; veins dark brown. Venation: *Sc* short, Sc_1 ending but a short distance beyond the origin of *Rs*, Sc_2 removed from the tip of Sc_1, lying proximad of the origin of *Rs*; Sc_1 longer than *Rs*; *Rs* very short, straight, oblique, shorter than R_2+_3; *r* on R_2 about its own length belond the fork of R_2+_3; deflection of M_1+_2 very short, so *M* is almost in alignment with M_1+_2, the latter weak and without macrotrichiae on its basal third; basal deflection of Cu_1 about its own length beyond the fork of *M*; cells M_2 and Cu_1 deep, Cu_2 being about three times the deflection of Cu_1.

Abdomen brownish black. Male hypopygium surrounded by four flattened digitiform lobes; a central black penis-guard that is inserted far in the body, the base flattened, the middle portion deeply constricted. Ovipositor with the valves short and blunt, simulating the male hypopygium.

Holotype: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀, pinned with the ♂. *Paratopotypes,* 4 ♂ ♀'s.

Limnophila platensis sp. n.

Antennae dark brown; mesonotum yellowish brown, the praescutum with four, narrow, dark brown stripes; pleura yellow, with small, brown spots above the middle and hind coxae; halteres elongate; wings dusky, with small, brown spots, including a longitudinal series in cell *R*; cell M_1 present, long; abdominal tergites dark brown, margined posteriorly with yellow.

♂. Length 8.4-9 mm.; wing 9.5-10.6 mm. ♀. Length 10 mm.; wing 10 mm.

Rostrum brown; palpi with the basal segment light brown, the distal segments black. Antennae dark brown throughout, moderately elongate, the flagellar segments long-oval with the longest verticils on the dorsal surface. Head brownish yellow, the center of the vertex brown.

Pronotum dark brown medially, paler laterally. Mesonotal praescutum yellowish brown, with four, narrow, dark brown stripes, the intermediate pair narrowly separated, their anterior ends divergent; scutum broadly dull yellow medially, the lobes brownish testaceous; scutellum yellowish testaceous; postnotum with the posterior half yellow, the anterior half brownish. Pleura light yellow, sparsely pruinose; a conspicuous, brownish black spot at the base of the middle coxa; a smaller but similar spot at the base of the hind coxa. Halteres long and slender, dark brown, the extreme base of the stem paler.

Legs with the coxae and trochanters dull yellow; femora yellowish brown, the tips a little darker; remainder of the legs dark brown.

Wings with a dusky tinge; stigma not well-defined; small brown spots on the wing-surface, distributed as follows: A cloud at the origin of *Rs;* spots at tip of *Sc*, fork of *Rs*, fork of R_2+_3, ends of R_1 and R_2; narrow seams along the cord and outer end of cell *1st* M_2; a large cloud in cell *Cu* near midlength; in addition, a series of from two to ten brown spots in cell *R*, rather equidistantly spaced, sometimes more or less confluent, resulting in a reduction in number; veins dark brown. Venation: Sc_2 at the tip of Sc_1, the latter ending opposite or slightly beyond the fork of R_2+_3; *Rs* long, strongly angulate or sometimes spurred at origin; R_2+_3 varying in length, sometimes longer than the deflection of Cu_1; *r* at tip of R_1; cell *1st* M_2 long and narrow; cell M_1 deep, two to three times as long as its petiole; basal deflection of Cu_1 some distance beyond the fork of *M;* vein *2nd A* very long, ending beyond the origin of *Rs*.

Abdominal tergites dark brown, the caudal margins of the segments narrowly and indistinctly yellow; two, small, yellow dots near midlength of the tergites; sternites more uniformly brownish yellow, the lateral margins at midlength more infuscated; hypopygium dark brown.

♀. Similar to the male but the wing-pattern is more clear-cut. Ovipositor with the tergal valves slender, upcurved.

Holotype: ♂, Palo Blanco, La Plata, April 18, 1920 (C. Bruch). *Allotopotype:* ♀, May 2, 1920. *Paratopotypes:* 5 ♂'s, April 18-24, 1920.

Brachypremna australis sp. n.

Frontal prolongation of the head and mouth parts light yellow; head light gray; mesonotal praescutum yellowish brown with two, intermediate, parallel, dark brown stripes; lateral stripes pale brown, each sending a brown line laterad to the margin of the sclerite; a conspicuous,

black, rounded spot at the pseudosutural foveae; tibiae and tarsi uniformly dark brown; wings light grayish yellow, the costal and apical region more saturated.

♂. Length 11.5 mm.; wing 13.3-13.5 mm. ♀. Length 14 mm.; wing 14.2-15.2 mm.

Frontal prolongation of head and the mouth parts conspicuously light yellow; palpi with the basal two segments dark brownish black, the distal segments paler brown. Antennae with the scapal segments light yellow, sparsely pollinose; flagellum dark brown, the basal two or three segments more brownish yellow. Head light gray, dusted with yellow.

Pronotum pale buff, with three brown markings, the median mark broadest. Mesonotal praescutum rather bright yellow to reddish brown, subshiny; three praescutal stripes, the broad median stripe almost of the ground-color, the margins conspicuously but narrowly dark brown, these markings ending before the suture; lateral stripes pale brown, from the anterior end of each a darker mark extends laterad to the margin of the sclerite; pseudosutural foveae small, rounded, black; scutum with the median area dull yellow, each lobe more grayish, with a V-shaped brown marking; scutellum yellow with a small brown spot in the center; postnotum brownish yellow with a brown longitudinal stripe on either side of the narrow median line. Pleura pale yellow, sparsely pruinose, the mesepisternum a little infuscated. Halteres yellow, the knobs pale brown.

Legs with the coxae pale, the middle coxae with a rounded dark brown spot on the cephalic face, the posterior coxae with a slightly larger spot on the outer face; trochanters dull yellow; femora brownish yellow, the tips narrowly dark brown; tibiae and tarsi uniformly dark brown.

Wings light grayish yellow, the costal region more saturated yellow; apex slightly darkened; stigma yellow, narrowly encircled with brown; some of the longitudinal veins narrowly seamed with darker, clearest at the tips of R_4+_5 and M_1. Venation: *r-m* very short or obliterated by the punctiform contact of R_4+_5 on M_1+_2; vein *2nd A* very short.

Abdominal tergites yellowish brown, the subterminal tergites darker, almost black; lateral margins of sclerites narrowly grayish; sternites with elongate-oval black marks; male hypopygium light yellow. In the female, the abdomen is uniformly light brown, but the basal tergite shows two parallel darker longitudinal stripes.

Holotype: ♂, La Granja, Alta Gracia, Córdoba, April 1-8, 1920 (C. Bruch). *Allotopotype:* ♀. *Paratopotypes:* several of both sexes, some in alcohol.

Brachypremna australis is the most southerly representative of the genus yet made known. In the venation and uniformly darkened tibiae and tarsi, it agrees only with the Amazonian *B. uniformis* Alexander, from which it differs conspicuously in its yellow mouth parts and conspicuous thoracic pattern.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JUNE, 1923.

The Worthy Flea.

In years gone by more than one entomological journal has drawn remarks appropriate to our science from the writings of Oliver Wendell Holmes. Another source, also of high literary quality, for critiques of the study, and of students, of insects is to be found in *Enjoying Life and Other Literary Remains* of W. N. P. Barbellion. Barbellion was the pen name of Bruce Frederick Cummings, for five years on the entomological staff of the British Museum, the brief announcement of whose death is to be found in the NEWS for May, 1920, page 149. One of his delightful essays is entitled *The Scarabee Monographed,* published originally in *The Forum* and reprinted in *Enjoying Life*. Here is a bit that will surely whet the reader's appetite for more:

> Recollecting, perhaps, the sentiment expressed by Boyle, that nothing can be unworthy of investigation by man that was not unworthy of being created by God, a member of the wealthy Rothschild family is at the present moment the foremost authority on the Siphonaptera, a name which polite students give to the fleas. In the lay mind the flea is only a joke—and always one which must be cracked. But, "pour les vrais savans," he is a serious and very attractive study in comparative anatomy, bionomics and metamorphosis. Even lice have never lacked students. Henry Denny monographed the British species as early as 1842. The "Monographia Anoplurum Britanniae" is a very curious old book, concluding with a quotation from the 91st Psalm: "These all wait upon Thee that Thou mayest give *them* their meat in due season."

Cellucotton for Packing Unmounted Insects.

During the summer of 1919 the writer began using cellucotton as a substitute for glazed cotton, for packing unmounted insects as collected in the field. This material has been used each year since, and with evident satisfaction on the part of all who have tried it. For entomological purposes cellucotton has been found superior to glazed cotton on the following counts: thick layers may be cut easily with scissors to fit any container; the material may be separated readily into layers of any desired thickness at the moment of using; there are no fibers to cling to the insects such as may occur when using cotton.

Cellucotton is a woodpulp product, apparently developed during the war period as a substitute for cotton in all its uses as an absorbent material and for surgical dressings. For those purposes it is excellent, but cellucotton is now being put to other uses where soft thin layers are required, such as packing for delicate glassware or unmounted insects. This material may now be obtained in rolls 24 inches wide and weighing approximately 17 pounds. A recent quotation gave the price as 23 cents per pound, and it takes a considerable volume to make a pound. The roll may be unwound into a layer one inch thick, and this in turn, if desired, be separated into thin sheets little thicker than lens paper. Cellucotton may now be obtained from most wholesale drug firms, although the chief distributing agency appears to be the Lewis Manufacturing Company, Walpole, Massachusetts.—HARRY H. KNIGHT, University of Minnesota.

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

The titles occurring in the Entomological News are not listed.

4—Canadian Entomologist, Guelph, Canada. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Cal. **16**—The Lepidopterist, Salem, Mass. **24**—Annales de la Societe Entomologique de France, Paris. **50**—Proceedings of the United States National Museum. **71**—Novitates Zoologicae, Tring, England. **72**—The Annals of Applied Biology, London. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **89**—Zoologische Jahrbucher, Jena. **95**—Annales des Sciences Naturelles, Zoologie, Paris. **104**—Zeitschrift fur Wissenschaftliche Zoologie, Leipzig. **106**—Anales de la Sociedad Cientifica Argentina, Buenos Aires. **109**—Annales Historico-Naturales Musei Nationalis Hungarici, Budapest. **111**—Archiv fur Naturgeschichte, Berlin. **114**—Entomologische Rund-

schau, Stuttgart. **138**—American Museum Novitates, New York. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **143**—Stettiner Entomologische Zeitung.

GENERAL. Browne, H. B.—"Window" envelopes [for papered specimens]. **9,** lvi, 92-3. **Gahan, A. B.**—The role of the taxonomist in present day entomology. **10,** xxv, 69-78. **Howes, P. G.**—Photographing insect life. (Nature Mag., May, 1923, 9-14.) **Littlewood, F.**—Killing with cyanide. **9,** lvi, 90-2. **Lutz, F. E.**—Flowers and their insect visitors. (Nat. Hist., New York, xxii, 125-34.) **McCulloch & Hayes**—The reciprocal relation of soil and insects. (Ecology, iii, 288-301.) **O'Hea, J. P.**—Tactile vision of insects and arachnida. **76,** cxi, 498. **Phisalix, M.**—Animaux venimeux et venins. Tome I. Masson & Cie., Paris, 1922.

ANATOMY, PHYSIOLOGY, ETC. Rabaud, E.—Recherches sur la variation chromatique et l'homochromie des arthropodes terrestres. **78,** lvii, 1-69.

ARACHNIDA AND MYRIOPODA. Mello-Leitao—Quelques Araignees nouvelles ou peu connus du Bresil. **24,** xci, 209-28.

Chamberlin, R. V.—The No. American species of Mimetus. **13,** xv, 3-9. **Ewing, H. E.**—The dermanyssid mites of North America. **50,** lxii, Art. 13.

THE SMALLER ORDERS OF INSECTA. Campion, H.—On the use of the generic name Brachycercus in Plectoptera and Orthoptera. **11,** xi, 515-18. **Durken, B.**—Die postembrionale entwicklung der trachenkiemen und ihrer muskulatur bei Ephemerella ignita. **89,** xliv, Anat., 439-626. **Ewing, H. E.**—New genera and species of sucking lice. (Jour. Wash. Ac. Sci., xiii, 146-9.) **Kennedy, C. H.**—The naiad of Pantala hymenaea (Odonata.) **4,** lv, 36-8. The ecological relationships of the dragonflies of the Bass Islands of Lake Erie. (Ecology, iii, 324-36.) **Kruger, L.**—Psychopsidae. Beitrage zu einer monographie der Neuropteren-familie der Psychopsiden. Berothidae. Beitrage zu einer monographie der Neuropteren familie der Berothiden. Hemerobiidae. Beitrage zu einer monographie der Neuropteren-familie der Hermerobiiden. **143,** lxxxiii, 17-48; 49-88; 138-72.

McDunnough, J.—New Canadian Ephemeridae with notes. **4,** lv, 39-50.

ORTHOPTERA. Campion, H.—(See under Smaller Orders.) **Caudell, A. N.**—A new sp. of Zoraptera from Bolivia. **10,** xxv, 60-2. **Fontes et Veloso.**—Sur lest mouvements automatiques des muscles des pattes de Blatta germanica. **77,** lxxxviii, 835-37.

HEMIPTERA. Davidson, J.—Biological studies of Aphis rumicis. The penetration of plant tissues and the source of the food

supply of aphids. **72,** x, 35-54. **Dudich, E.**—Die Phymatiden des Ungarischen national museums. **109,** xix, 161-81. **Gerhard, W. J.**—The periodical cicada. (Field Mus. N. H., Leafl. 4.) **Parshley, H. M.**—On the ecology of Podops cinctipes and Rhytidolomia saucia. **4,** lv, 69-71.

Hungerford, H. B.—Some studies on the genus Hydrometra in America, north of Mexico, with description of a n. sp. **4,** lv, 54-8.

LEPIDOPTERA. Ainslie, G. G.—A corn-feeding geometrid (Pleuroprucha insulsaria.) **82,** xxiii, 89-101. **d'Almeida, R. F.**—Notes sur quelques lepidopteres Rhopaloceres du Bresil. **24,** xci, 229-35. **Bowman, K.**—Annotated check list of the Macrolepidoptera of Alberta. **4,** lv, 71-2. **Coolidge, K. R.**—Notes on California moths. **139,** xxii, 16. **Jordan, K.**—On the sensory organ found on the head of many lepidoptera. On the scent-organs in the males of certain American Castniidae. A note on the families of moths in which vein 5 of the forewing arises from near the center or from above the center of the cell. **71,** xxx, 155-8; 159-62; 163-66. On the comb-bearing flap present on the fourth abdominal segment in the males of certain Notodontidae. **71,** xxx, 153-57. **Littlewood, F.**—(See under General.) **Mousley, H.**—Erora laeta Edwards. **4,** lv, 26-9.

Cassino & Swett—Some new Geometridae. **16,** iv, 1-8. **Hill, C. A.**—A new sp. and a new var. of noctuid moths from Southern California. **139,** xxii, 17-19.

DIPTERA. Becker, T.—Dipterologische studien. Dolichopodidae. B. Nearctische und Neotropische region. (Abh. Z. B. Gesell. Wien, xiii, 1-294, 1921.) **Duda, O.**—Revision der altweltlichen arten der gattung Borborus (Capsela.) **111,** 1923, A. 4, 35-112. **Greene, C. T.**—The immature stages of Hydrophorus agalma. **10,** xxv, 66-9. **Surcouf, J. M. R.**—Dipteres nouveaux ou peu connus. **24,** xci, 237-44. **Tonnoir, A.**—Le cycle evolutif de Sactylocladius commensalis sp. n. Chironomide a larve commensale d'une larve de Blepharoceride. (An. Biol. Lacustre, xi, 279-91.)

Curran, C. H.—Our No. American Leucozona, a variety of lucorum (Syrphidae.) **4,** lv, 38. The Stenosyrphus sodalis group (Syrphidae.) An apparently undescribed species of Scellus (Dolichopodidae.) Change of names. **4,** lv, 59-64; 73-4; 74. **McAtee, W. L.**—Descriptions of Bibio from the Carolinas. **10,** xxv, 62-4.

COLEOPTERA. Brethes, J.—Descripcion de varios coleopteros de Buenos Aires. **106,** xciv, 263-305. Primera contribucion para el conocimiento de los "Strepsiptera" Argentinos. Apendice. Hymenoptera. (Rev., Facult. La Plata, xv, 41-56.) **Bridwell, J. C.**—The host plant and habits of Acanthoscelides griseolus. **10,** xxv, 79-80. **Buchanan, L. L.**—The European Amalus haemorrhous, in

the U. S. **10,** xxv, 79. **Cameron, M.**—Descriptions of new species of Staphylinidae from the West Indies. **11,** xi, 363-400. **Kleine, R.**—Bestimmungstabelle der gattung Arrhenodes. **111,** 1923, A, 4, 169-80. **Kriesche, R.**—Zur kenntnis der Lucaniden. **143,** lxxxiii, 115-37. **Mueller, R.**—Ueber die sinneszellen im fuhler von Necrophorus vespillo. **114,** xl, 9-10. **Notman, H.**—A new genus and sp. of Staphylinidae parasitic on a S. American opossum. **138,** No. 68. **Schenkling, S.**—Coleopterorum catalogus. Pars 76: Cryptophagidae. **Scott, H.**—Longevity of a cerambycid larva. **8,** 1923, 90.

HYMENOPTERA. Brethes, J.—(See under Coleoptera.) **Cockerell, T. D. A.**—Some bees from British Guiana. **11,** xi, 442-59. Some bees from Victoria, Mexico. **50,** lxiii, Art. 8. **DuBois, A. D.**—A study in ant-power. (Nature Mag., May, 1923, 8.) **Gahan & Fagan**—The type-species of the genera of Chalcidoidea or chalcidflies. (Bul. U. S. Nat. Mus., 124.) **Santschi, F.**—Description de nouvelles fourmis de l'Argentine et pays limitrophes. **106,** xciv, 241-62. **Sarin, E.**—Ueber fermente der verdauungsorgane der honigbiene. (Biochem. Zeit., Berlin, cxxxv, 59-84, 1922.) **Stumper, R.**—L'establissement des nouvelles colonies chez les fourmis. **95,** vi, 95-105. **Vogel, R.**—Zur kenntnis des feineren baues der geruchsorgane der wespen und bienen. **104,** cxx, 281-24.

Fouts, R.—Description of a new Serphoid parasite. **10,** xxv, 64-5. **Gahan, A. B.**—An Eulophid parasite of the chrysanthemum midge. **10,** xxv, 65-6. **Macgillivray, A. D.**—New western species of Dolerus. **4,** lv, 65-8.

RESPONSES OF THE LARGE WATER-STRIDER, GERRIS REMIGIS SAY, TO CONTACT AND LIGHT by C. F. CURTIS RILEY (Annals Ent. Soc. Amer. vol. XIV, No. 4, pp. 231-289).—Insect behavior receives so little attention from entomologists in general that it seems desirable to call attention to Prof. Riley's paper. It is probably difficult for economic entomologists to see any intimate relationship between insect control and many of the reactions produced by the work of complex external and internal forces, and collectively called behavior. However, a better understanding of the forces which call forth responses from living matter might lead to new methods for use in the economic field. The study of insect behavior calls for careful work in the laboratory and field on account of the various factors involved and the possibility of drawing wrong conclusions from too few, or wrongly correlated, data or failure to take physiological conditions into account. Prof. Riley's paper deals with the general responses to contact and light of *Gerris remigis*, one of the common species of aquatic Heteroptera, which lives usually on water-films of medium-sized permanent brooks and creeks. He found that the species responded readily to contact stimuli from

various objects in its habitat and that variations in responses took place when the stimuli were similar and general conditions were unchanged. These variations he states are probably due to different internal conditions at different times. Of course this is not a satisfactory explanation of such variations, but no other course was open to Prof. Riley in view of the absence of data and the difficulty of studying differences due to changes in the internal condition of the insects. The grouping of the animals, commonly in the fall, through contact stimuli and the various factors bearing on such aggregations and their later disintegration are discussed in an interesting manner, as are also the effects of severe droughts, rain and wind storms. It appears that responses to contact stimuli are strongly in evidence at the beginning of and during the hibernating period. So far as photic stimuli are concerned, *Gerris remigis* responded readily to various intensities. On certain occasions in laboratory aquaria it acted negatively phototactic to sunlight. To the stimuli of electric lights of 22 ca. m. and 44 ca. m., Prof. Riley found that the majority of the gerrids responded positively, the orientations and movements being less pronounced when light of lesser intensity was used. Stationary, oscillating and moving but not oscillating lights were used in the experiments. The author covers the habitat responses to sunlight only to a small extent but a later paper on this subject is promised. He concludes "that responses to contact and to photic stimulation play an important rôle in the daily lives of the water-striders," many of the normal habitat activities being due to the thigmotactic and phototactic propensities of the insects. The work of other investigators is reviewed throughout and the paper is accompanied by 12 figures, most of them being photographs of field conditions. These illustrations did not gain anything by being printed on the same kind of paper as the text.—HARRY B. WEISS, New Brunswick, N. J.

OBITUARY.

I have recently heard that Dr. R. A. DUMMER, the distinguished botanist and collector, is dead. In the Report of the South African Museum for the past year there is a note by Dr. Péringuey, as follows:—"I much regret to say that I have received news of the death, by accident, of this collector." Since Dr. Dummer has advertised so extensively in "Entomological News," and undoubtedly has many correspondents in America who are awaiting news of him, I thought that it might be desirable to publish a brief statement to this effect.

CHARLES P. ALEXANDER.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

For Exchange—A large number of live cocoons of Callosamia promethea, C. cynthia and P. cecropia for other pupae or Lepidoptera. D. C. Heim, Sunbury, Pa.

Wanted to Exchange—N. A. Coleoptera for same not in my collection. Carl Selinger, 4419 Dover St., Chicago, Ill.

Wanted for Cash or Exchange—Catocala eggs, also brilliant colored butterflies and moths for trays. Mrs. Robert Milde, Lewiston, Minn.

Syrphidae from all parts of North America wanted. Monographing the family.—C. H. Curran, Department of Entomology, University of Kansas, Lawrence, Kansas.

Will collect in all orders except Lepidoptera, in exchange for Cerambycidae (longicorn beetles) and Pentatomidae (stink-bugs). G. Chagnon, P. O. Box 521, Montreal, Canada.

I will collect Coleoptera and Lepidoptera in southwest Arkansas for those so interested.—Miss Louise Knobel, 417 West 2nd Avenue, Hope, Arkansas.

Correspondence solicited from anyone desiring general collections of insects, to be made in Costa Rica. Austin Smith, Apartado 412, San José, Costa Rica.

Wanted—Am working on a Revision of the Buprestidae of the West Indies and would like to examine any material in this family from that region. W. S. Fisher, U. S. National Museum, Washington, D. C.

For Exchange—A large number of Papilio Turnus, P. Cresphontes and P. Ajax pupae, or the same specimens in papers, for other pupae or Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

Wanted—Dytiscidae not in my collection, in exchange for local specimens. Offer Coelambus sellatus, Oregonus, etc. F. S. Carr, 11050 123rd St., Edmonton, Alberta.

Coleoptera for exchange—Cicin. generosa, hirticollis, modesta, sexguttata, 12-punctata, Saperda populnea, Uro. fasciata, Donacia subtilis, palmata, texana-minor, biimpressa, refuscens. Ernest Baylis, 5011 Saul St., Philadelphia, Pa.

Endomychidae. I desire to purchase representatives of this family from any part of the world. Particularly desire specimens from the western and southwestern part of the U. S. L. B. Walton, Kenyon College, Gambier, Ohio.

Buprestidae, Cleridae and **Carabinae** wanted from U. S. or Buprestidae of the world. Will collect insects of any group (except Lepidoptera) in exchange or pay cash. Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

Lepidoptera. Hesperiidae (Skipper-butterflies). Will purchase, exchange or name specimens. North or South America. Pamphila comma group particularly desired. Henry Skinner and R. C. Williams, Jr., Address Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

RECENT LITERATURE

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GENERAL.

832.—**Crampton** (G. C.).—The genitalia of male Diptera and Mecoptera compared with those of related insects, from the standpoint of phylogeny. (Trans., **48**, 207-225, 3 pls., 1923) ..... .50

DIPTERA.

833.—**Malloch** (J. R.).—Flies of the anthomyiid genus Phaonia and related genera, known to occur in N. A. (Trans., **48**, 227-282, 3 pls., 1923)..... 1.25

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830.—**Cresson** (E. T., Jr.).—The Bassett types of Cynipidae. (Trans., **48**, 197-203, 1923)..... .15

835.—**Frison** (T. H.)—Systematic and biological notes on bumblebees (Bremidae). (Trans., **48**, 307-326, 1923)..... .40

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831.—**Bell** (E. L.).—A new species of Hesperiidae. (Trans., **48**, 205-206, 1923) ..... .10

834.—**Skinner & Williams.**—On the male genitalia of the Hesperiidae of N. America. Paper II. (Trans. **48**, 238-306, ill, 1923)..... .48

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829.—**Hebard** (M.).—Dermaptera and Orthoptera from the state of Sinaloa, Mexico, Pt. I. Dermaptera and non-saltatorial Orthoptera. (Trans., **48**, 157-196, 2 pls., 1923) ..... .85

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